

# MTF- Tester K8

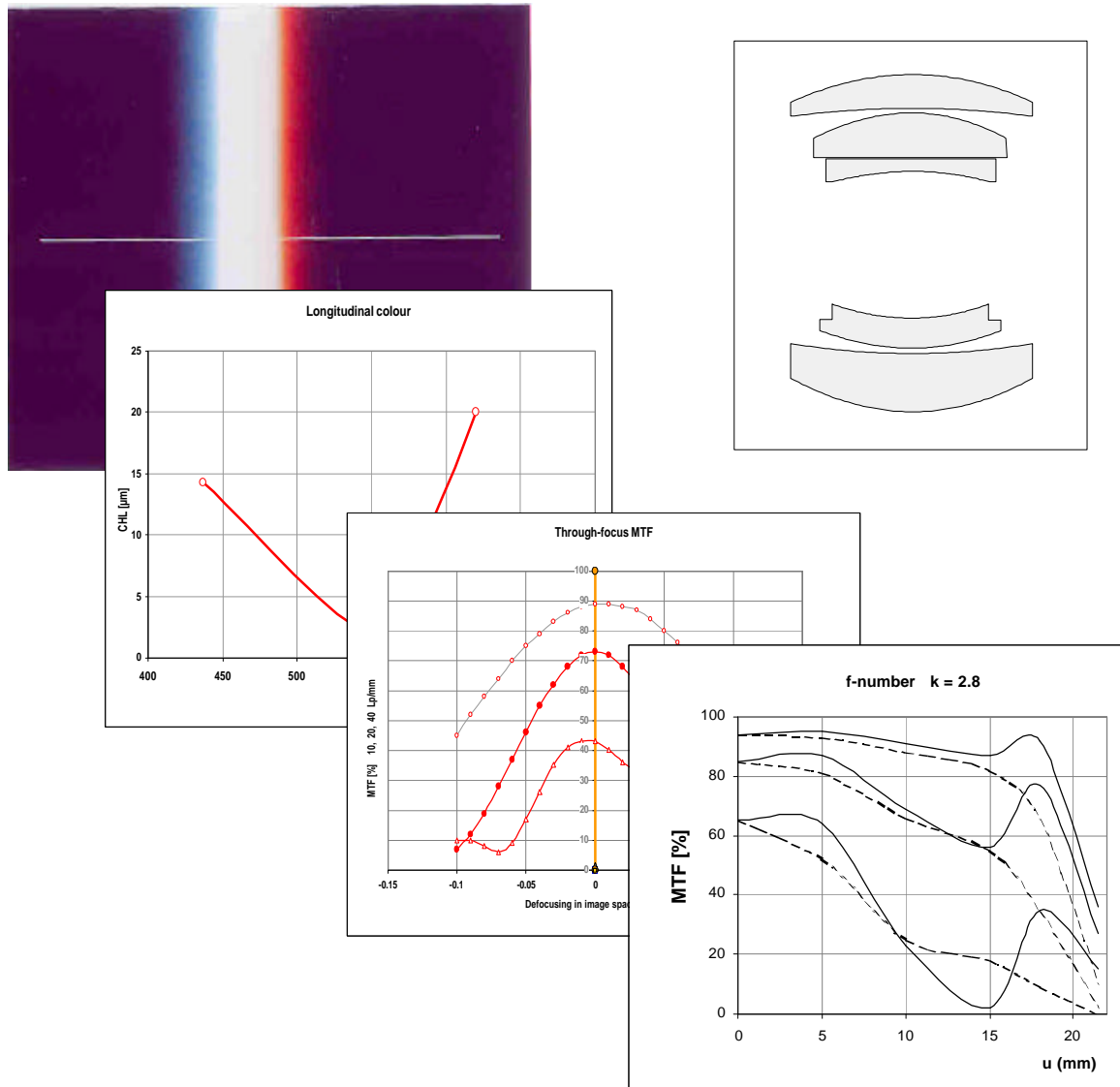


The **modulation transfer function ( MTF )** is since many years an established concept to describe the image quality of lenses. It's fast and simple measurement is an indispensable tool in industrial and application oriented laboratories.

The MTF-Tester **K8** of Carl Zeiss is a versatile and compact instrument for the measurement of the modulation transfer function of photographic lenses or similar systems at infinite object distance. The measurement is performed in real-time at three different spatial frequencies. The measurement is based on a line image analysis by means of a scanning slit system.

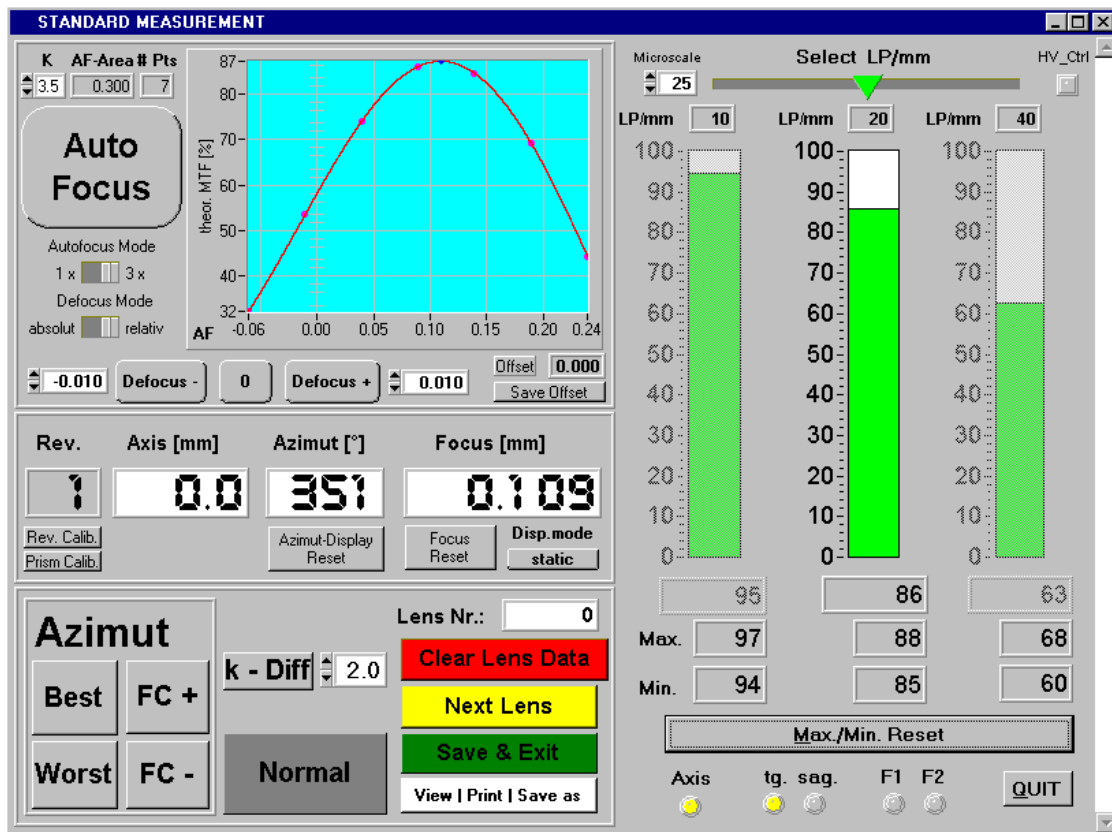
The **K8** is founded on more than 40 years of experience in using the MTF in the lab and in industrial production control at Carl Zeiss.

## Features and measuring facilities



- Visual presentation of point-spread and line-spread functions on a colour TV monitor
- Simultaneous MTF-measurement at three spatial frequencies
- MTF as a function of image height and as a function of backfocal distance
- Simple switching between tangential and sagittal slit orientation
- Measurement in real-time supports fine tuning of lenses during assembly
- Easy change between different spectral weighting functions
- Measurement of field curvature and longitudinal chromatic aberration
- Measurement of flange-back distances
- Rapid change between measurement on axis and in the field
- Sample rotation 360°, with automatic recording of minimum and maximum MTF
- Low space requirement

## Software and operation



- Operation and control of main hardware components by mouse, footswitch and function keys of the PC-keyboard
- Graphical and digital presentation of MTF values
- Graphical presentation of the through-focus MTF-curve
- Software controlled manual focusing
- Automatic focusing at user-selected spatial frequency
- Image height indicator
- Sample azimuth indicator
- Focus position indicator
- Focus shift measurement
- Data-Recording
- Simple measurement of aperture depending focus shift
- Operating system: Windows-NT<sup>®</sup>



## Technical data and modules

- **Illumination system**

Standard light source	Halogenlamp 12 V, 100 W, 3200K
Standardfilter	Schott BG38
Additional filterholder	5, for customer-specified filters
Slit width	0.03 mm and 0.3 mm, motorised revolver

- **Collimators**

Standard	Lens type, Achromat 80/1200 mm
Special version 2.2 m	Lens type, Achromat 150/2250 mm

- **Light path**

Standard	sliding mirror for on-axis measurement, tilting and sliding mirror for field measurement
Special version 2.2 m	single mirror for axis and field measurement, sliding and tilting

- **Sample stage**

Baseplate	Thread mount M 82x1 for customer-specified adapters
Ballbearing turntable	Rotation 360° (optional with encoder) , centring facility of baseplate
Lateral shift	Precision bearing for up to 50 mm shift from axial position
Focus stability	better than 0.02 mm at 30mm image height
Focus drive	motorised, step resolution 0.001mm
Maximum sample length	ca. 500 mm
Maximum sample weight	ca. 10 Kg



- **Analyser**

Line image analysis	scanning slit system with motor 1500 r/min, digital filtering of the Fourier spectrum at three frequencies with ratio 1:2:4, scaling of spatial frequency by microscope objective
Calibration	with synthetic line image (rectangular slit)
Microscope objective	used to form a magnified image of the sample image at the scanning slit system, the magnification determines the set of spatial frequencies and the window size of integration, the numerical aperture determines the maximum possible chief ray angle during measurement in the field of the sample
Standard-objective	25x / 0.65 for spatial frequencies 10, 20 and 40 Lp/mm, window size 0.4 mm
Optional objectives	for spatial frequencies 2-200 Lp/mm
Lightsensor	1 1/8" side-on PMT , Hamamatsu R446
Spectral weighting	The total spectral weighting function of the system (without sample) is individually certified.
Image orientation	motorised Schmidt-prism
Line image-display	1/2 " -colour-CCD camera, 12" -monitor

- **Repeatability**

better than 5% at 20 Lp/mm and image height 30mm

- **Controller**

Computer	Standard PC, Windows-NT®
PI-Motor-Control Unit	15" TFT-monitor



- **Options**
  - electronic image height encoder
  - electronic azimuth encoder
- **Dimensions and weight**
  - WxHxD      1700 x 1300 x 800 mm
  - ca. 200 Kg
- **Environment conditions**
  - temperature    18 ... 23 °C
  - humidity        20 ... 76 %
  - dust free
  - minimum air flow
- **Power supply**
  - 240V AC / 50 Hz, 800VA

Subject to change

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